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EXAMINER	
BELL, MELTIN	

ART UNIT	PAPER NUMBER
2121	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/854,337	SCHMIDT, RICHARD Q.	
	Examiner	Art Unit	
	Meltin Bell	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 May 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 May 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3, 4 and 7*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This action is responsive to application **09/854,337** filed 05/11/01.

Claims 1-30 have been examined.

Priority

Applicant's claim for domestic priority against application number 60/203,216 filed **5/11/00** under 35 U.S.C. 119(e) is acknowledged.

Information Disclosure Statement

Applicant is respectfully reminded of the ongoing Duty to disclose 37 C.F.R. 1.56 all pertinent information and material pertaining to the patentability of applicant's claimed invention, by submitting in a timely manner PTO-1449, Information Disclosure Statement (IDS) with the filing of applicant's application or thereafter.

The information disclosure statement filed 8/3/01 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because of missing or inaccurate information in the listing:

- The 'Patent Seems Designed for Debate' article is missing the publisher.

The information disclosure statement filed 7/13/01 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because of missing or inaccurate information in the listing:

- The Other Documents references are missing the year and month of publication.

It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Drawings

The United States Patent and Trademark Office of Draftsperson's Patent Drawings Review have reviewed the formal drawings. They are objected to by the Draftsperson under 37 CFR 1.84 or 1.152 for the reasons indicated on the Form PTO-948, Notice of Draftsperson's Patent Drawing Review.

The drawings have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is required in correcting any errors of which applicant may become aware in the drawings.

Specification

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is required in correcting any errors of which applicant may become aware in the specification.

The disclosure is objected to because of the following informalities:

The 'continues until from step 222' phrase on page 12, line 14 skips other important steps of the process and items of the flowchart in FIG. 3 (steps/items 222, 224 or 226, 230 and 220).

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The invention as disclosed in claims 1, 19, 24, 26 and 28 are directed to non-statutory subject matter. Claims 1, 19, 24, 26 and 28 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a credible asserted utility or a well established utility.

As a carrier medium, claim 24 is not statutory subject matter.

As methods, claims 1, 19, 26 and 28 offer abstract ideas (e.g. "data", "patterns", "conclusions") that are also not applied in the technological arts. Abstract ideas and their manipulation constitute "descriptive material" that is not patentable, *Warmerdam*, 33 F.3d at 1360, 31 USPQ2d at 1759 and *Schrader*, 22 F.3d at 292-93, 30 USPQ2d at 1457-58, respectively. If the abstract ideas of claims 1, 19, 26 and 28 represented functional descriptive material consisting of data structures and computer programs which impart functionality when employed as a computer component (recorded on some computer readable medium), they become structurally and functionally interrelated to

the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. For examples,

- *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) offers claim to data structure stored on a computer readable medium that increases computer efficiency held statutory and
- *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 offers product-by-process claim to computer having a specific data structure stored in memory also held statutory while
- *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 offers claim to a data structure *per se* held nonstatutory.

Because the claims are not claimed to be practiced on a computer and/or stored on a computer readable medium, they are not limited to practical applications in the technological arts. Specifically, the claims are carrier medium and methods without any particular practical application, such as a program running on a computer and stored in a computer readable medium or memory. On that basis alone, those claims are clearly nonstatutory.

Claims 1, 19, 24, 26 and 28 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a credible asserted utility or a well established utility. Claims 1, 19, 24, 26 and 28 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a credible asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Claim Rejections - 35 USC § 112

To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 19, 24, 26 and 28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Support for this 35 U.S.C. 112, first paragraph rejections comes from MPEP 2164.07(l)(A):

"As noted in *In re Fouche*, 439 F.2d 1237, 169 USPQ 429 (CCPA 1971), if "compositions are in fact useless, appellant's specification cannot have taught how to use them." 439 F.2d at 1243, 169 USPQ at 434. The examiner should make both rejections (i.e., a rejection under 35 U.S.C. 112, first paragraph and a rejection under 35 U.S.C. 101) where the subject matter of a claim has been shown to be nonuseful or inoperative.
The 35 U.S.C. 112, first paragraph, rejection should indicate that because the invention as claimed does not have utility, a person skilled in the art would not be able to use the invention as claimed, and as such, the claim is defective under 35 U.S.C. 112, first paragraph."

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim recites 'selecting another attribute pattern from said collection of data' twice without distinguishing between the two occurrences. The use of both attribute patterns selected from said collection of data is not clear suggesting a typo.

Claim Rejections - 35 USC § 102

To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 16-17 and 24-25 are rejected under 35 U.S.C. 102(b) as being anticipated by *Cohen* U.S. Patent Number 5,719,692 (Issued February 17, 1998).

Claim 18 is rejected under 35 U.S.C. 102(e) as being anticipated by *Barrack et al* U.S. Patent Number 6,047,279 (Issued April 4, 2000; Filed November 17, 1997).

Claims 19 and 21-22 are rejected under 35 U.S.C. 102(e) as being anticipated by *Yoshida* U.S. Patent Number 6,006,213 (Issued December 21, 1999; Filed March 28, 1995).

Regarding claim 16:

Cohen teaches,

- a first code section executable to find within a collection of data related to said situation a representative collection of data comprising attribute patterns and associated conclusions (FIGS. 1 and 7; column 1, lines 26-38, "Unclassified data 107...to its class")

- a second code section executable to compare a selected attribute pattern to all other attribute patterns associated with conclusions different than that of said selected attribute pattern in said representative collection to match irrelevant attribute elements between said selected attribute pattern and said compared attribute patterns (FIGS. 1 and 8, item 801)

- a third code section executable to remove said irrelevant attribute elements from said selected attribute pattern (FIGS. 1 and 9, item 903)

- a fourth code section containing logic executable to repeat said second and third code sections for each attribute pattern to form a set of rules (FIGS. 1 and 7, item 701)

Regarding claim 17:

- a fifth code section executable to remove redundant rules from said set of rules (FIGS. 1 and 11, item 1109)

Regarding claim 18:

Barrack et al teaches,

- a storage media coupled to said network and containing a set of data records related to said situation (FIG. 1; column 2, lines 56-67, "Gateway 12 includes...and response interactions")

- each of said data records includes an attribute pattern and an associated conclusion (column 3, lines 1-13, "Intelligent Gateway 12...incoming raw data")

- a processor coupled to said network and operable to manipulate said set of data records to form a representative collection of attribute patterns and associated conclusions storable on said storage media (FIGS. 1 and 2; column 3, lines 26-42, "IDEAS^{TM} 13 (a...to be taken")

- said processor being further operable to manipulate said representative collection to remove attribute elements from each of said attribute patterns that are irrelevant to said associated conclusions to form a set of rules storable on said storage media (FIGS. 1 and 2, column 2, lines 56-67, "Gateway 12 includes...and response interactions")

- said processor is further operable to remove redundant ones of said rules from said set of rules to provide a complete and consistent rule set (Abstract, sentences 3-4, "The inventive system...the new element")

Regarding claim 19:

Yoshida teaches,

- finding all non-redundant fact patterns related to said situation in a data set (FIG. 1; column 2, lines 62-67, "When the temporary...a classification rule")

- identifying at least one attribute in each fact pattern that contributes to a respective conclusion associated with said fact pattern (column 1, lines 60-65, "The object is...good evaluation result")

- forming said set of rules using said identified attributes and said respective associated conclusions (column 2, lines 3-6, "A pattern is...is then output")

Regarding claim 21:

Yoshida further teaches,

- said data set consists of a set of records being selected to have a first conclusion in a reduced ratio with respect to a second conclusion (column 6, lines 14-22, "If the pattern...the root node"; column 6, lines 49-67, "The following steps...third and subsequent"; column 7, lines 1-18, "terms are prediction...the whole algorithm")

Regarding claim 22:

Yoshida further teaches,

- each said fact pattern is associated with a group of conclusions (column 5, lines 55-63, "Each node corresponds...may be stored")

- said method further comprises a selecting a single conclusion from each of said groups as said respective associated conclusion (FIGS. 4-6; column 2, lines 62-67, "When the temporary...a classification rule")

Regarding claim 24:

Cohen teaches,

- a first code section executable to find within a collection of data related to said situation a representative collection of data comprising attribute patterns and associated conclusions (FIGS. 1 and 7; column 1, lines 26-38, "Unclassified data 107...to its class")

- a second code section executable to compare a selected attribute pattern to all other attribute patterns associated with conclusions different than that of said selected attribute pattern in said representative collection to match irrelevant attribute elements between said selected attribute pattern and said compared attribute patterns (FIGS. 1 and 8, item 801)

- a third code section executable to remove said irrelevant attribute elements from said selected attribute pattern (FIGS. 1 and 9, item 903)

- a fourth code section containing logic executable to repeat said second and third code sections for each attribute pattern to form a set of rules (FIGS. 1 and 7, item 701)

Regarding claim 25:

Cohen teaches,

- a first code section executable to find, within a collection of data related to a situation, a representative collection of data comprising attribute patterns and associated conclusions (FIGS. 1 and 7; column 1, lines 26-38, "Unclassified data 107...to its class")

- a second code section executable to compare a selected attribute pattern to all other attribute patterns associated with conclusions different than that of said selected attribute pattern in said representative collection to match irrelevant attribute elements

between said selected attribute pattern and said compared attribute patterns (FIGS. 1 and 8, item 801)

- a third code section executable to remove said irrelevant attribute elements from said selected attribute pattern (FIGS. 1 and 9, item 903)

- a fourth code section containing logic executable to repeat said second and third code sections for each attribute pattern to form a set of rules (FIGS. 1 and 7, item 701)

- a fifth code section executable to remove redundant rules from said set of rules (FIGS. 1 and 11, item 1109)

Claim Rejections - 35 USC § 103

To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-15, 20, 23, 26-27 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Yoshida* U.S. Patent Number 6,006,213 (Issued December 21, 1999) in view of *Cohen* U.S. Patent Number 5,719,692 (Issued February 17, 1998).

Regarding claim 1:

Yoshida teaches,

- finding within a collection of data related to said situation a representative collection of data comprising attribute patterns and associated conclusions; forming said set of rules by: (column 1, lines 60-67, "The object is...computer is also"; column 2, lines 1-6, "converted into a...is then output")

- a) comparing a selected attribute pattern to all other attribute patterns associated with conclusions different than that of said selected attribute pattern in said representative collection to match irrelevant attribute elements between said selected attribute pattern and said compared attribute patterns (column 2, lines 42-49, "patterns appearing in...are then output")

- repeating a) and b) for each attribute pattern in said representative collection (FIG. 1; column 2, lines 59-61, "The pattern modification...pattern is extracted").

However, *Yoshida* doesn't explicitly teach removing irrelevant attribute elements while *Cohen* teaches,

- a) comparing a selected attribute pattern to all other attribute patterns associated with conclusions different than that of said selected attribute pattern in said representative collection to match irrelevant attribute elements between said selected attribute pattern and said compared attribute patterns (FIG. 9, items 903, 905 and 909)

- b) removing said irrelevant attribute elements from said selected attribute pattern (column 3, lines 21-33, "Pruning is implemented...the empty rule").

Motivation – The portions of the claimed method would have been a highly desirable feature in this art for

- Saving time and space while improving classification quality (*Cohen*, column 3, lines 61-65, "Making a small...the rule set")
- Ensuring good classification results (*Yoshida*, column 1, lines 60-67, "The object is...is then input").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Yoshida* with *Cohen* to obtain the invention specified in claim 1, a method for formulating a set of rules representing a situation. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently and correctly generate situation classification rules.

Regarding claim 2:

The rejection of claim 1 is incorporated. Claim 2's further limitations are taught in *Cohen:*

- removing redundant rules from said set of rules (column 4, lines 2-3, "rules are pruned...the description length").

Therefore, claim 2 is rejected under the same rationale as claim 1.

Regarding claim 3:

The rejection of claim 2 is incorporated. Claim 3's further limitations are taught in *Yoshida:*

- said collection of data can be chosen to increase the relative occurrence of an infrequently occurring association between a subset of said attribute patterns and said associated conclusions (column 2, lines 59-61, "The pattern modification...pattern is extracted"; column 8, lines 5-28, "FIG. 9 illustrates...the learned operations").

Therefore, claim 3 is rejected under the same rationale as claim 2.

Regarding claim 4:

The rejection of claim 1 is incorporated. Claim 4's further limitations are taught in

1) *Yoshida*:

- finding said representative collection includes: (column 1, lines 60-67, "The object is...computer is also"; column 2, lines 1-6, "converted into a...is then output")
- forming said representative collection with an initial attribute pattern and an associated conclusion indication drawn from said collection of data (FIG. 1)
- selecting another attribute pattern from said collection of data (FIG. 1)
- a) selecting another attribute pattern from said collection of data (FIG. 1)
- b) comparing said selected attribute pattern with all attribute patterns in said representative collection (FIG. 1)
- d) adding a conclusion, indication associated with said selected attribute pattern to an associated conclusion indication of a matching attribute pattern in said representative collection (column 6, lines 14-19, "If the pattern...from each pattern")

- repeating a) through d) until all attribute patterns in said collection of data are exhausted (FIG. 1; column 2, lines 59-61, "The pattern modification...pattern is extracted"),

2) *Cohen*:

- c) adding said selected attribute pattern and an associated conclusion indication to said representative collection if said selected attribute pattern matches none of said attribute patterns in said representative collection (FIG. 8).

Therefore, claim 4 is rejected under the same rationale as claim 1.

Regarding claim 5:

The rejection of claim 4 is incorporated. Claim 5's further limitations are taught in *Yoshida*:

- choosing a representative conclusion for each of said attribute patterns in said representative collection by identifying a predominant conclusion based on said associated conclusion indication (column 5, lines 46-52, "FIG. 4 illustrates...for each pattern").

Therefore, claim 5 is rejected under the same rationale as claim 4.

Regarding claim 6:

The rejection of claim 4 is incorporated. Claim 6's further limitations are taught in *Yoshida*:

- selecting a representative conclusion for at least one of said attribute patterns in said representative collection based on relevant knowledge about said collection of data

(column 2, lines 62-67, "When the temporary...a classification rule"; column 5, lines 55-63, "Each node corresponds...may be stored").

Therefore, claim 6 is rejected under the same rationale as claim 4.

Regarding claim 7:

The rejection of claim 4 is incorporated. Therefore, claim 7 is rejected under the same rationale as claim 4.

Regarding claim 8:

The rejection of claim 4 is incorporated. Claim 8's further limitations are taught in *Yoshida*:

- said associated conclusion indication contains associated conclusion counts (column 3, lines 10-30, "In the designation...have the Pattern").

Therefore, claim 8 is rejected under the same rationale as claim 4.

Regarding claim 9:

The rejection of claim 2 is incorporated. Claim 9's further limitations are taught in *Cohen*:

- each rule in said set of rules is expanded into a canonical form before removing said redundant rules (FIGS. 3-4; column 3, lines 8-20, "a rule is...the growing dataset"; column 1, lines 60-62, "classifier program 115...expressions are true") .

Therefore, claim 9 is rejected under the same rationale as claim 2.

Regarding claim 10:

Yoshida teaches,

- each of said data records includes an attribute pattern and an associated conclusion (column 5, lines 45-52, "the patterns are...for each pattern").

However, *Yoshida* doesn't explicitly teach storage media or processors while *Cohen* teaches,

- a storage media containing a set of data records related to said situation (FIG. 1, item 103 MEMORY SYSTEM)

- a processor operable to manipulate said set of data records to form a representative collection of attribute patterns and associated conclusions storable on said storage media (FIG. 1, item 105 DIGITAL PROCESSOR)

- said processor being further operable to manipulate said representative collection to remove attribute elements from each of said attribute patterns that are irrelevant to said associated conclusions to form a set of rules storable on said storage media (column 3, lines 21-33, "Pruning is implemented...the empty rule")

- said processor is further operable to remove redundant ones of said rules from said set of rules to provide a complete and consistent rule set (column 4, lines 2-3, "rules are pruned...the description length").

Motivation – The portions of the claimed system would have been highly desirable features in this art for

- Saving time and space while improving classification quality (*Cohen*, column 3, lines 61-65, "Making a small...the rule set")

- Ensuring good classification results (*Yoshida*, column 1, lines 60-67, "The object is...is then input").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Yoshida* with *Cohen* to obtain the invention specified in claim 10, a system for formulating a set of rules representing a situation. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently and correctly generate situation classification rules.

Regarding claim 11:

The rejection of claim 10 is incorporated. Claim 11's further limitations are taught in *Cohen*:

- a sample space including said set of data records (FIG. 1)

- said processor being operable to select said set of data records from said sample space to increase a relative occurrence frequency of an infrequently occurring situation (column 4, lines 19-27, "The invention further...and multiple classes").

Therefore, claim 11 is rejected under the same rationale as claim 10.

Regarding claim 12:

The rejection of claim 10 is incorporated. Claim 12's further limitations are taught in *Cohen*:

- said storage media contains at least one attribute pattern associated with a plurality of conclusions (FIG. 1)

- said processor is operable to select a single conclusion as a representative conclusion from said plurality based on a specified criteria (column 3, lines 8-20, "a rule is...the growing dataset").

Therefore, claim 12 is rejected under the same rationale as claim 10.

Regarding claim 13:

The rejection of claim 12 is incorporated. Claim 13's further limitations are taught in *Yoshida*:

- said specified criteria is provided by an expert (column 1, lines 12-16, "The present invention...a person heretofore"; column 7, lines 56-67, "FIGS. 8a and...the user, the"; column 8, lines 1-4, "program for performing...by the user").

Therefore, claim 13 is rejected under the same rationale as claim 12.

Regarding claim 14:

The rejection of claim 10 is incorporated. Claim 14's further limitations are taught in *Cohen*:

- said processor is operable to expand said set of rules into a canonical form before said redundant ones of said rules are removed (FIGS. 3-4; column 3, lines 8-20, "a rule is...the growing dataset"; column 1, lines 60-62, "classifier program 115...expressions are true").

Therefore, claim 14 is rejected under the same rationale as claim 10.

Regarding claim 15:

Yoshida further teaches,

The rejection of claim 10 is incorporated. Claim 15's further limitations are taught in

1) *Yoshida*:

- said manipulation of said representative collection includes (FIG. 9; column 7, lines 34-43, "FIGS. 7A and...formatted of document")

- a comparator module coupled to said processor and operable to provide a comparison between a selected attribute pattern and all other attribute patterns having conclusions different that that of said selected attribute pattern (FIG. 1),

2) *Cohen*:

- a comparator module coupled to said processor and operable to provide a comparison between a selected attribute pattern and all other attribute patterns having conclusions different that that of said selected attribute pattern (FIG. 5, item 503)

- said processor is further operable to identify said irrelevant attribute elements in said selected attribute pattern as selected attribute elements that match attribute elements in said all other attribute patterns (column 3, lines 21-33, "Pruning is implemented...the empty rule").

Therefore, claim 15 is rejected under the same rationale as claim 10.

Regarding claim 20:

Yoshida's teachings from claim 19 include the following:

- finding all non-redundant fact patterns related to said situation in a data set (FIG. 1; column 2, lines 62-67, "When the temporary...a classification rule")

- identifying at least one attribute in each fact pattern that contributes to a respective conclusion associated with said fact pattern (column 1, lines 60-65, "The object is...good evaluation result")

- forming said set of rules using said identified attributes and said respective associated conclusions (column 2, lines 3-6, "A pattern is...is then output").

However, *Yoshida* doesn't explicitly teach removing rule redundancies while *Cohen* teaches,

- removing redundancies within said set of rules (column 3, lines 21-33, "Pruning is implemented...the empty rule"; column 4, lines 2-3, "rules are pruned...the description length").

Motivation – The portions of the claimed method would have been a highly desirable feature in this art for

- Saving time and space while improving classification quality (*Cohen*, column 3, lines 61-65, "Making a small...the rule set")
- Ensuring good classification results (*Yoshida*, column 1, lines 60-67, "The object is...is then input").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Yoshida* with *Cohen* to obtain the invention specified in claim 20, a method for forming a set of rules representing a situation. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently and correctly generate situation classification rules.

Regarding claim 23:

The rejection of claim 20 is incorporated. Claim 23's further limitations are taught in *Cohen*:

- said rules are expanded into a canonical form prior to removing redundancies (FIGS. 3-4; column 3, lines 8-20, "a rule is...the growing dataset"; column 1, lines 60-62, "classifier program 115...expressions are true").

Therefore, claim 23 is rejected under the same rationale as claim 20.

Regarding claim 26:

Yoshida teaches,

- obtaining a set of data records related to said situation, each data record containing a set of attributes and an associated conclusion (column 5, lines 45-52, "the patterns are extracted...for each pattern")
- forming a first set of mutually exclusive attribute patterns from said data records, each attribute pattern being associated with a respective conclusion group containing at least one conclusion (column 2, lines 42-67, "patterns appearing in...a classification rule")
- maintaining a count of data records associated each conclusion in each respective conclusion group (column 3, lines 9-17, "In the designation...nature of problem")
- forming a second set of attribute patterns from said first set, each attribute pattern in said second set being associated with a preferred conclusion chosen from said respective associated conclusion group, said attribute patterns in said second set containing attributes relevant to said situation, said second set of attribute patterns

being formed by (FIG. 1; column 5, lines 55-63, "Each node corresponds...may be stored"; column 6 lines 14-22, "If the pattern...the root node")

- a) creating in said second set a copy of a selected attribute pattern with an associated preferred conclusion from said first set (FIG. 1; column 5, lines 55-62, "Each node corresponds...rules are applicable")

- b) comparing said copied selected attribute pattern to all other attribute patterns in said first set having associated preferred conclusions different from said associated preferred conclusion of said copied selected attribute pattern thereby identifying any attributes of said copied selected attribute pattern that are irrelevant to said situation (FIG. 1; column 2, lines 42-49, "patterns appearing in...are then output")

- repeating a), b) and c) for each attribute pattern in said first set to form said second set of attribute patterns comprising said set of rules (FIG. 1).

However, *Yoshida* doesn't explicitly teach removing irrelevant attribute patterns while *Cohen* teaches,

- b) comparing said copied selected attribute pattern to all other attribute patterns in said first set having associated preferred conclusions different from said associated preferred conclusion of said copied selected attribute pattern thereby identifying any attributes of said copied selected attribute pattern that are irrelevant to said situation (FIG. 9, items 903, 905 and 909)

- c) removing said irrelevant attributes from said copied selected attribute pattern in said second set (column 3, lines 21-33, "Pruning is implemented...the empty rule").

Motivation – The portions of the claimed method would have been highly desirable features in this art for

- Saving time and space while improving classification quality (*Cohen*, column 3, lines 61-65, "Making a small...the rule set")
- Ensuring good classification results (*Yoshida*, column 1, lines 60-67, "The object is...is then input").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Yoshida* with *Cohen* to obtain the invention specified in claim 26, a method for formulating a set of rules representing a situation. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently and correctly generate situation classification rules.

Regarding claim 27:

The rejection of claim 26 is incorporated. Claim 27's further limitations are taught in *Yoshida*:

- choosing as said set of data records a subset of data records from all available data records to increase a relative occurrence of an infrequently occurring conclusion (column 2, lines 59-61, "The pattern modification...pattern is extracted").

Therefore, claim 27 is rejected under the same rationale as claim 26.

Regarding claim 28:

Yoshida teaches,

- obtaining a set of data records, each data record containing a set of attributes forming an attribute pattern and an associated conclusion (column 5, lines 45-52, "the patterns are extracted...for each pattern")

- forming from said set of data records a first set of mutually exclusive attribute patterns each associated with a conclusion group containing at least one conclusion, said first set of attribute patterns being formed by (column 2, lines 42-67, "patterns appearing in...a classification rule")

- a) placing a copy of an initial attribute pattern and an initial associated conclusion from an initial data record into said first set of attribute patterns, said initial associated conclusion being placed in a conclusion group in said first set of attribute patterns, and initializing a first conclusion count for said initial associated conclusion placed in said first conclusion group (FIG. 1)

- b) reading an attribute pattern and an associated conclusion from a selected data record (FIG. 1)

- c) comparing said read attribute pattern to all attribute patterns of said first set of attribute patterns (FIG. 1)

- d) if said read attribute pattern matches none of said first set of attribute patterns, adding said read attribute pattern and said read associated conclusion from said selected data record into said first set of attribute patterns, said read associated conclusion being placed in another conclusion group associated with said read attribute

pattern added to said first set of attribute patterns, and initializing another conclusion count for said read associated conclusion in said another associated conclusion group (column 6, lines 14-67, "If the pattern...third and subsequent"; column 7, lines 1-18, "terms are prediction...the whole algorithm")

- e) if a match between said read attribute pattern and said first set of attribute patterns is found and if said read associated conclusion is already in a conclusion group associated with said matched attribute pattern in said first set of attribute patterns, incrementing a conclusion count for said read associated conclusion in said conclusion group associated with said matched attribute pattern, and if said read associated conclusion is not already in said conclusion group associated with said matched attribute pattern, adding said read associated conclusion to said conclusion group associated with said matched attribute pattern and initializing a conclusion count for said added read associated conclusion (FIG. 1)

- f) selecting another data record and reading an attribute pattern and an associated conclusion from said selected data record (FIG. 1)

- repeating c) through 0 until all attribute patterns for said set of data records are exhausted (FIG. 1)

- selecting a representative conclusion from each of said conclusion groups as a preferred conclusion based on criteria including said conclusion counts (column 5, lines 55-62, "Each node corresponds...rules are applicable")

- forming a second set of attribute patterns, each associated with respective preferred conclusions, said attribute patterns in said second set containing attributes relative to said situation, said second set of attribute patterns being formed by (FIG. 1)

- g) placing a copy of a selected attribute pattern and said associated preferred conclusion from said first set of attribute patterns into said second set of attribute patterns and comparing said copied selected attribute pattern to all other attribute patterns in said first set of attribute patterns having associated preferred conclusions different from said associated preferred conclusion of said copied selected attribute pattern thereby identifying any attributes of said copied selected attribute pattern that are irrelevant to said situation (FIG. 1)

- repeating g) and h) for each attribute pattern in said first set of attribute patterns to form said second set of attribute patterns, said second set of attribute patterns and associated preferred conclusions forming said set of rules (FIG. 1).

However, *Yoshida* doesn't explicitly teach removing irrelevant attribute patterns while *Cohen* teaches,

- selecting a representative conclusion from each of said conclusion groups as a preferred conclusion based on criteria including said conclusion counts (column 3, lines 8-20, "a rule is...the growing dataset")

- g) placing a copy of a selected attribute pattern and said associated preferred conclusion from said first set of attribute patterns into said second set of attribute patterns and comparing said copied selected attribute pattern to all other attribute patterns in said first set of attribute patterns having associated preferred conclusions

different from said associated preferred conclusion of said copied selected attribute pattern thereby identifying any attributes of said copied selected attribute pattern that are irrelevant to said situation (FIG. 9, items 903, 905 and 909)

- h) removing said irrelevant attributes from said copied selected attribute pattern in said second set (column 3, lines 21-33, "Pruning is implemented...the empty rule").

Motivation – The portions of the claimed method would have been highly desirable features in this art for

- Saving time and space while improving classification quality (*Cohen*, column 3, lines 61-65, "Making a small...the rule set")
- Ensuring good classification results (*Yoshida*, column 1, lines 60-67, "The object is...is then input").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Yoshida* with *Cohen* to obtain the invention specified in claim 28, a method for formulating a set of rules representing a situation. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently and correctly generate situation classification rules.

Regarding claim 29:

The rejection of claim 26 is incorporated. Therefore, claim 29 is rejected under the same rationale as claim 26.

Regarding claim 30:

The rejection of claim 26 is incorporated. Claim 30's further limitations are taught in *Yoshida*:

- at least one of said preferred conclusions is chosen based on relevant knowledge (column 1, lines 12-16, "The present invention...a person heretofore"; column 7, lines 56-67, "FIGS. 8a and...the user, the"; column 8, lines 1-4, "program for performing...by the user").

Therefore, claim 30 is rejected under the same rationale as claim 26.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- *Cohen;* U.S. Patent Number 5,719,692
- *Yoshida;* U.S. Patent Number 6,006,213
- *Barrack et al;* U.S. Patent Number 6,047,279
- *Schmidt;* U.S. Patent Number 5,259,066; Associative Program Control
- *De Silva*; U.S. Patent Number 5,758,031; Rule Generating Method and Apparatus
- *Paillet*; U.S. Patent Number 5,642,471; Production Rule Filter Mechanism and Inference Engine for Expert Systems
- *Ishibuchi et al*; "Minimizing the Fuzzy Rule Base and Maximizing Its Performance by a Multi-Objective Genetic Algorithm"; Annual Meeting of the North American Fuzzy Information Processing Society; 21-24 September 1997; pp 251-256

- *Tan*; "Cascade ARTMAP: Integrating Neural Computation and Symbolic Knowledge Processing"; IEEE Transactions on Neural Networks; Vol. 8, Iss. 2; March 1997; pp 237-250

- PCT Search Report dated 11/12/02

Any inquiry concerning this communication or earlier communications from the Office should be directed to Meltin Bell whose telephone number is 703-305-0362. This Examiner can normally be reached on Mon - Fri 7:30 am - 4:30 pm.

If attempts to reach this Examiner by telephone are unsuccessful, his supervisor, Anil Khatri, can be reached on 703-305-0282. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

MB

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PRIMARY EXAMINER 1/12/04
For Anil Khatri